Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
Amendment of Parts 1, 21, 73, 74 and 101 of the Commission's Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands	)	
Transforming the 2.5 GHz Band	)	WT Docket No. 18-120

September 5, 2018

Reply Comments of
THE FRIDAY INSTITUTE FOR EDUCATIONAL INNOVATION AT NORTH CAROLINA STATE UNIVERSITY

Background

The Friday Institute for Education Innovation, part of the College of Education at North Carolina State University, provides strategic thought leadership on issues related to school connectivity for the entire state of North Carolina. Over the last decade, the Friday Institute, in cooperation with the North Carolina Department of Public Instruction, has developed a program that ensures that virtually every public school in North Carolina has a fiber connection and that virtually every classroom has a Wi-Fi access point. North Carolina has accomplished this with the support of the FCC E-rate program and the concerted efforts of numerous educators in the state.

In recent years, the need for home internet access for all students has become a crucial objective. We began analyzing the EBS licenses in North Carolina in 2017, about a year before the NPRM. We discovered a broken regulatory structure in which a chosen few are receiving lease revenue and a miniscule number of students were actually benefiting. In fact, we find no direct evidence to correlate EBS spectrum usage to educational outcomes. However, we view EBS as an incredible opportunity, that with the correct regulatory framework, and properly organized educators, could attack the challenges of rural broadband and the homework gap.

North Carolina State University does not hold any EBS licenses. There are approximately 70 EBS licenses active in North Carolina, with the majority of them under long term lease contracts with a single large service provider. All but two licenses were provided to the University System, various community colleges, and county-based school districts.

Overview

While we are keenly aware of the success that a handful of educational institutions have had in deploying their own network (e.g. Northern Michigan University), this appears to be the exception rather than the rule. We suggest that, in most cases, an individual school district, college, or university is not equipped or staffed to deploy and run an LTE network. Why then would the FCC continue to issue licenses to entities who will simply lease them to commercial providers? We have inspected some of these leasing agreements and find no evidence that the institutions have any metrics on educational use of their own licenses, nor are they (for the most part) properly skilled to assess the true value of the license, spectrum in general, or the incredible educational opportunity that is going untapped with EBS. We generally believe that licenses should be awarded to the entities that ultimately will implement the technology that uses them: service providers or statewide (or large regional) agencies that can better oversee them. At the same time we believe EBS should be used primarily for educational purposes, especially in rural communities. We appreciate the investment in wireless infrastructure that has been made by providers, where it has been made. We do not seek to disrupt working business models which are providing competitive service to all residents including students. That said, we see significant problems with rural build-out, and fallow spectrum that is licensed and leased, but not deployed.

In short, licenses should be awarded to operators (possibly including commercial, for-profit) and agencies who can best utilize them and provide the best stewardship of the spectrum. Licenses should not be doled out as "free money" for schools to flip. New licenses and services should be biased towards K-20 customers but should also enable commercial services that benefit entire communities. In fact remote healthcare applications may be the next most important use of EBS in the future. Build-out requirements and coverage rules must be monitored by educators and enforced by the FCC. Mechanisms that allow educators to track and report service to their students should be made available and the results periodically published so that license holders and the FCC can evaluate the efficacy of the spectrum usage.

We find that often, school boards do not understand the intricacies of spectrum policy, leasing or its value. As a result schools are often locked into leases with very long terms, and little leverage to renegotiate, even as technology continues to progress exponentially. This is likely the case in North Carolina, where we suspect the majority of the EBS licenses are in long term agreements with right-of-first-refusal clauses. Under the current licensing and leasing rules and agreements, EBS in North Carolina will merely amount to thousands of cell phones being provided to students with no coordination as to how they are being used for educational purposes, if at all.

Consider in 1995, the last time EBS licenses were available, the average person did not own a cell phone, the high-end PC was a 150 MHz (0.15 GHz) Intel Pentium, and the IEEE 802.11 Wi-Fi standard was two years away from being ratified. We urge the Commission to balance the rate at which technology, specifically in the wireless industry, changes with the time horizon needed by operators to build successful business models. Thirty year leases make little sense today, and five year (at most) compliance checks should the the rule. Failure to comply with the educational requirements (assuming new, modern, measurable, and logical standards are created) should result in partial or full forfeiture of EBS licenses and terminate any lease.

As suggested by the Consortium for School Networking (CoSN), Nebraska Department of Education et al. (Nebraska), Utah Education and Telehealth Network (UETN), North Carolina Broadband Infrastructure Office, Northern Michigan University (NMU), Schools Health & Libraries Broadband Coalition (SHLB) and several others, we agree that statewide or large,

multi-county organizations, institutions, or agencies are better equipped to coordinate services when commercial entities are unable to profitably service an area. One can envision a multi-county, non-profit, public-private partnership, or governmental entity successfully managing a network or orchestrating a group of for-profit providers. Many states have research and education networks, rooted most often in the university systems, which have the potential to scale across multiple student populations (K-12, community college, university) and provide a cohesive and equitable service to **all** students. This does not imply that these entities would own and operate networks, (in fact, in North Carolina that would likely be prevented by statute) but rather these institutions/organizations/agencies could provide oversight and management of providers. This would ensure educational use is verified, and in some cases it is possible that the agencies could provide or coordinate subsidies (much like federal level Universal Service Fund) to encourage build-out in places that do not yet meet the density requirements of the typical operator's business model.

Throughout our reply comments we suggest there are three key topics which must be addressed if EBS is to be used to its fullest potential:

1. The footprint of the license cannot be arbitrary. Unused, but licensed (and leased) spectrum is a serious impediment for rural educators and small providers seeking to start up new services.
2. Issuances of new licenses should me merit-based.
3. Enforcement of modern, measurable, and logical educational use and build-out requirements is the only way to prevent fallow spectrum.

Reply Comments on Specific Comments

State Educational Technology Directors Association, SETDA

While the Friday Institute and SETDA have collaborated on many topics in K-12 education technology in the past, these NPRM comments were developed without input from the Friday Institute. It is encouraging to report that we support almost every aspect of the SETDA comments to this NPRM. We highlight a few specific points of note in the following paragraphs.

We agree that if EBS were modernized to better match the use of technology in education, that several million students, especially in rural areas, would have newfound access to broadband resources while away from school. In particular, we note the mention of the Northern Michigan University EBS LTE network. We agree that this model has merit in the remote parts of our nation. However, in urban areas where providers are already making an investment, it may be more efficient for the spectrum to be licensed directly to a commercial provider who is then subject to strict oversight of the build-out and educational use requirements.

While NMU is a shining example of what could be done, there are few remote rural places in the United States with the resources and foresight to deploy such a network. We believe the Commission should allow education focused non-profit, public-private partnerships and/or consortia to obtain licenses, if and only if they have a bona fide deployment and operations plan or proven track record with similar endeavors. We do not feel, as many commentators have suggested that any educational institution, by its very nature of having students, is qualified to hold an EBS license. Many commenters have suggested various auctions and first-come-first-served application processes for licenses, but a more rigorous and thoughtful analysis of the application should focus on the likelihood of near term deployment to the largest population with the least risk. It would be a shame for NMU to express interest in expanding service to other rural areas of the state, perhaps for distance learning, only to have their application denied because it was submitted a few milliseconds after another entity with no proven track record.

We fully agree with SETDA on page 6 regarding the ability of state education agencies and educational service agencies to hold licenses. Again, if these agencies can provide a bona fide plan for how the spectrum will be used, then licenses should be issued. Specifically in these cases, the Commission should consider rules for bulk licenses in rural areas for these types of agencies. We believe this is supported by the NPRM comments of others, notably in the overall spirit of the comments by Utah Education and Telehealth Network as well as specifically by the North Carolina Broadband Infrastructure Office on page 4.

Also on page 6 of SETDA, we note that while state educational agencies are almost always given statutory authority to provide shared infrastructure, they are not always given the

budget. The Commission should provide licenses to states or regions that have highly functional education resource agencies, but not preclude commercial enterprises from picking up where governmental leadership or funding falls short.

Statewide (or very large area) license pools with coordinated spectrum usage and service expectations would help level the playing field and minimize fallow spectrum. Some states may choose to develop grant programs to offset the cost of rural development and incentivize entrepreneurs to build networks. Free access to spectrum could greatly help statewide programs scale up faster and with better service.

We somewhat diverge from SETDA on page 7 with respect to assigning or transferring EBS licenses to commercial enterprises. Especially in urban areas, and where build-out requirements have been met, keeping a school district (which has no real power to control a lessee) as the license holder does not seem to improve the educational impact. We have inspected several lease agreements between school districts and large commercial operators and they provide little leverage for the school to compel any action or ensure education use. Given the lax or non-existent enforcement of the educational use requirements over the last two decades, we do not see the value in keeping the spectrum licensed to a school so that it may in turn receive a small royalty. A different approach in urban, built out environments is to allow the school district to ensure compliance with the educational use requirement, and transfer their license to an operator. In many of these lease agreements, the exit terms for just such a transfer have already been specified. Thus we expect this is something the large operators have been expecting and petitioning for since EBS license rules were last changed. We reiterate the overarching theme of our reply comments: none of the changes to EBS will help students, unless the educational use and build-out requirements are modernized, policed, and enforced.

We agree with SETDA on page 8, in that all leases, and in fact all EBS licenses, should be subject to periodic review to ensure the spectrum is being used to its highest educational potential. Also on page 8 we fully agree that new, meaningful build-out and use requirements should be developed by the Commission. In fact, different requirements might be suitable for rural and urban licenses. EBS spectrum warehousing should be stopped. Any metric based on hours rather than bits should be eliminated. Build-out should be measured in percentage of K-20

students reached by service, rather than square miles of coverage. Private companies, such as RootMetrics, are already well on the way to developing smartphone apps that could be used to measure compliance. (See: http://webcoveragemap.rootmetrics.com/en-US)

We fully agree with SETDA on page 9 regarding auctions. We cannot imagine a worse scenario for the taxpayer than two public entities bidding up the price of spectrum, in the name of educating students. That makes no sense and will likely lead to manipulation of the auction system by well-funded enterprises. As SETDA, UETN and others have suggested, we agree that licenses should be conditioned on the applicant's ability to comply with the requirements.

Finally on page 9 of SETDA, we agree that E-rate rules should be modified, but this is part of a much different conversation and likely a future NPRM. We do note that in the not too distant future, the line between WiFi-based LANs and LTE-based WANs could disappear. Imagine a school campus completely blanketed by 5G LTE signal in every classroom, and student devices with integrated LTE radios. As schools, like businesses, move more and more content to the cloud, the need for local infrastructure is reduced. EBS could play an important role in completely re-shaping the way Internet is delivered to the classroom; and by the same token, to the student's home. We welcome discussion on this topic with all interested parties, particularly large operators.

School Superintendents Association (AASA) and Association of Educational Service Providers

We generally do not agree with the overall spirit or tone of the comments from AASA. Specifically, the first benefit of EBS spectrum listed in AASA (page 4) is the revenue generated by the lease. Generating revenue from EBS spectrum is counter productive to providing access to rural students. Furthermore, licenses provided to private schools may be unduly enriching specific groups of citizens rather than the public at large. Commissioner O'Rielly and Chairman Pai specifically mentioned the concerns over "middlemen" and flipping licenses in their statements in the NPRM. The AASA comments seem to support just that behavior.

We **do** agree with AASA in that expansion of licenses to existing holders that have not demonstrated stewardship of the spectrum is not warranted and will unfairly enrich both license holders and leaseholders. We also agree that the ULS database is not extremely helpful and our

analysis of our existing approximately 70 EBS licenses in North Carolina was an art, rather than an exact science. Given that we see no way around arbitrarily-shaped license footprints (whether they are census tracts, counties, or split footballs) an improved license system would be greatly appreciated and likely required in the future. Even with GIS expertise, and GPS coordinates provided by ULS, the multi-way split football calculations and frequency overlap in our analysis could not be considered authoritative.

We partly agree with AASA on page 9 regarding expansion to county lines. In North Carolina, expansion to county lines would **not** provide excessive unjust enrichment to existing leaseholders, but that is because the average county in North Carolina is on the order of 500 square miles. However, in many states counties are much larger and county expansion simply does not make sense. We suggest that the Commission allow expansion of current licenses to county borders but within some defined specifications. For example, no expansion larger than 1,000 square miles should be permitted for any given license. We also agree with many other commenters that suggest no expansion if at least (on the order of) 30% of a county is not already covered. Metrics based on population rather than area might also be warranted in this decision. Yet again, we reiterate that any license expansion should also be subject to the enforcement of the build-out and educational use requirements.

We also believe special rules should be put in place with regards to crossing state boundaries. For example, a school district in North Carolina should not have a license into Virginia where none of the district's students live. Many consortia and public-private partnerships will be bound to a single state of service, for various legal and operational reasons, so providing licenses that cross state boundaries will likely lead to fallow spectrum. Should the Commission decide to allow commercial entities to obtain licenses, and should license issuance be based on merit, then licenses crossing state boundaries may not be an issue.

Finally we note that future licenses, especially west of the Mississippi, where relatively few licenses have been issued, the Commission should consider a license footprint that prevents slivers between each other, for example a hexagon or octagon shape. A hexagon with six sides measuring 38.5 miles would have the same coverage area as a circle of 35 mile radius, but adjacent licenses would leave no dead spaces.

On page 10 of AASA, we believe the example given (Labette County, Kansas) is actually demonstrative of why school districts **should not** be provided EBS licenses. In this case neighboring districts have locked up all the spectrum of Labette County. However, we point out that had a statewide or regional consortia or public-private partnership been issued the licenses and focused on providing service to students rather than revenue generation, this would not be an issue.

On page 14 of AASA, we again disagree and in fact find their point regarding lessees determining the speed of deployment counter to their argument supporting licenses being issued to K-12 schools. If EBS had well-defined and measurable metrics then Labette County could compel (via an FCC procedure) the license holders and lessee to provide service or forfeit part or all of their license. There is no evidence correlating EBS licenses to educational outcomes. In fact, we have seen evidence from an independent source that a large operator in North Carolina is carrying over 60% of their commercial traffic on 2.5GHz, yet we have tens of thousands of students with no access to broadband, of any type, at their homes. We suspect a similar situation is taking place in Kansas, in the example provided by AASA.

Also on page 14, the statement that "local presence should mean classrooms" is objectionable. In fact one of the most likely uses of EBS is rural home access for students. In North Carolina we have students that have school bus rides over an hour in duration. These are the students most likely to benefit from EBS, both at home and on the long bus ride. We also have many university research farms, forests, and cooperative extensions where learning occurs in non-traditional settings with no classroom. Any metric related to local presence should be based on the student, not solely on the location of classrooms.

On page 15 we agree with AASA, as stated earlier that auctions will not lead to successful outcomes for students or taxpayers. AASA makes a valid point about Dillon Rule states. We note, however, in North Carolina, there is significant control over the spending of state appropriated funds, but we find very little oversight with regard to school boards or colleges entering into 20 or 30 year lease agreements with egregious terms.

Competitive Carriers Association (CCA)

Regarding the flexibility to rationalize existing 2.5GHz holdings we generally agree with the CCA but point out that should the build-out requirement not be met by a provider, it is possible that licenses could be reduced to an arbitrary size, possibly based on census tract or other shape. If we consider the case of a county that is heavily populated on the west and very rural on the east we could envision high-density 2.5GHz service covering, say, 70% of the population. It may be in the best interest of the public to revoke the license for the area not sufficiently covered should a willing and bona fide provider come forward. We urge the Commission to consider flexibility, but not if it leads to spectrum warehousing.

On page 6 of CCA, we agree with the statement that the "Commission should institute reasonable performance requirements for 2.5GHz spectrum licensees that are consistent with build-out benchmarks for other spectrum bands." We note that "consistent" does not mean "equal to." Other commenters, such as UETN, have also acknowledged the WRS proceedings and unified regulatory framework. However, we believe the metrics for EBS could both enable operators to reliably model business cases and ROI while still fulfilling the needs of students. Metrics based on percentage of students "passed" by EBS, for example, would be a better than the X% bandwidth or an "X hours per week" of usage metric. While we agree it is not ideal, census data with age demographics could reasonably be used in many cases to predict compliance with an educational use build-out requirement. We believe, for a number of reasons, inevitably the Commission will arrive at a census tract based coverage area scheme. We have yet to find a comment that provides a solution that works in every state that is also reasonable and easy to manage.

Comments of Verizon, AT&T, Sprint, et al.

Rather than explicitly discussing each of the large incumbents, we note that we have an appreciation for the massive infrastructure investments that have been made. However, we must point out that these corporations will and should act in the best interest of their shareholders. Therein lies the issue with rural students and the homework gap: absent of a regulatory structure to ensure rural students are not left behind, incumbents will build where it maximizes their profit.

That means investment will be biased towards cities and highways. The FCC, USDA, and many other agencies spend an inordinate amount of effort on promoting rural broadband efforts, yet a large portion of the state of North Carolina is rural, is covered by an EBS license, has been leased to an incumbent, and has absolutely no 2.5GHz signal. We urge the Commission to carefully consider releasing more licenses that will likely be flipped and then warehoused to the detriment of students and educators. We would support provisions in EBS licenses that ensure small providers deploy equipment that will be compatible with incumbent carrier subscriber equipment. By allowing small, local entities to carry the risk, and build in locations where incumbents cannot meet ROI requirements, EBS spectrum could be an economic and entrepreneurial driver, potentially leading to acquisition by a larger provider in the future. Once a market is proven and built out, larger providers may find the risk/ROI profile acceptable. We cannot predict what new services and applications might flourish in a well-connected rural America. We also urge the Commission to not unduly release or auction 2.5GHz spectrum that will be warehoused. EBS is the last bastion of spectrum that could reasonably be applied to the enrichment of students on an equitable basis. We urge the Commission to move slowly and thoughtfully and allow education-oriented consortia and public-private partnerships to form and develop bona fide strategies for EBS. We also suggest that if a priority window scheme is instituted by the Commission that the very first priority be education-focused statewide agencies or large footprint consortia with the ability to execute and scale.

Wireless Internet Service Providers Association (WISPA)

We almost completely disagree with the comments of WISPA. They urge the Commission to effectively end EBS and position the spectrum to advantage non-incumbent, small providers. While we agree with WISPA and several Commissioners that EBS spectrum is currently only rarely used for educational content, we do not believe that the effort to focus on students should be abandoned and replaced with a laissez-faire system.

As many commenters have noted, lack of almost any action by the FCC over the last two decades has resulted in the current situation. We are hopeful that the Commission takes seriously the number of comments from bona fide education institutions that could leverage EBS if given

the chance. We agree with WISPA on several technical issues related to spectral efficiency, but not at the cost of completely losing the education mission of EBS.

Consortium for School Networking (CoSN)

The Friday Institute and members of CoSN have collaborated on many topics in K-12 education technology in the past, but these NPRM comments were developed independently from each other. We fully support the comments of CoSN and feel they represent a healthy attitude and environment where educators, service providers and technologists could work together for outstanding results.

R Street Institute

We wholey discount the comments of the R Street Institute because they seem to be made under the assumption that all regions of the United States have a functioning and competitive broadband market. Clearly, much of rural America does not have access to competitive broadband services. Simply running auctions for spectrum in locations where no service providers are willing to establish service will only result in more fallow, licensed, but unused spectrum. We support free markets where they exist. However, with over a gigahertz of spectrum available for various for-profit enterprises, it is in the public interest for the remaining portion of 2.5 GHz to retain some additional regulation and allow educators and consortia to innovate and incentivize rural network deployment.

We agree that EBS has not been used effectively in many cases, but now is an opportunity to modernize and innovate, rather than merely ceed to the status quo of other bands and incumbents.

North Carolina Broadband Infrastructure Office

We fully support the comments from the NC Broadband Infrastructure Office. Additionally we note that the General Assembly of North Carolina, in the 2018 budget (SB99, Session Law 2018-5) established a competitive grant program and initially funded it with $10,000,000. The legislation is prescriptive in how funds will be used, focusing on rural,

unserved areas. We believe this program could be the basis for greatly improved rural access and economic development. Free or low cost EBS spectrum provided to rural operators that seek grant funds and commit to providing services to the student population could be an additional incentive for new small providers to enter rural markets.

Additionally, North Carolina has, and continues to make, statutory changes easing the burdens for providers. For example, a new statute eliminates many hindrances for operators wishing to install small cell LTE equipment on publicly owned utility poles. As stated previously, there are statewide agencies and consortia that could better oversee the use of EBS spectrum than uncoordinated districts and colleges. The comments from NCBIO broadly define a framework for just such an endeavor.

Nebraska Department of Education et al.

We agree with Nebraska, and without delving into the specifics of their comments, merely note this is an outstanding example of how a statewide consortia can come together and demonstrate leadership in this space. Three separate state agencies, DoE, CIO and Nebraska Educational Television, worked together to develop outstanding comments and showcase some of the technological highlights of their pilot programs and state's infrastructure.

Specifically, in Nebraska at paragraph 27, we fully agree that the "State fulfills the definition of local presence, and can best determine the educational needs of its population, including K-12, higher education, and workforce development."

Northern Michigan University

We note that NMU has accomplished an impressive task and serves as a shining example of how EBS spectrum can be used effectively. The Commission should weigh their comments heavily as they have executed a successful strategy that clearly benefits students. We also note on page 9 the innovative idea of using ATSC 3.0 and LTE in an educational environment.

Schools, Health & Libraries Broadband Coalition (SHLB)

We almost entirely agree with the comments of SHLB. This organization presents a well-thought analysis. In particular, we support the statement on page 6 that "The FCC should make EBS licenses available to anchor institutions and non-profit providers who have the best incentive and experience to meet the public interest."

On page 9 of SHLB, we are not ready to take such a strong position on the transfer of licenses to commercial entities. We agree, that should the Commission allow transfer, the vast majority of licenses would be sold to the leaseholder. We suspect almost all lease contracts in effect today already specify terms for just such an event, and we note that given the option of a one-time payment, most school boards and college administrators would find the newfound "free" money hard to resist. However, short of a transfer to the leaseholder, where an extensive build-out has occurred, and having read the terms of several leases, we are not convinced there is a better alternative. Currently leased EBS spectrum is effectively gone, unless the FCC or the license holders actively work to ensure the educational use requirement is met.

If the Commission is serious about helping rural students, and new requirements are set for both new and existing EBS licenses, then transferring leases may not make sense. On the other hand, if the Commission decides EBS is not useful for educators and abandons the educational use requirement, then we should end the charade and get the education institutions out of the loop. We hope the Commission sides with the students and educators of America on this issue.

Utah Education and Telehealth Network (UETN)

UETN is another example of a statewide, education-focused institution with a long track record that could provide bona fide leadership of EBS in Utah. Their comments are well-reasoned and should be heavily weighed by the Commission.

The steps outlined in UETN on page 2 and 3 are logical and may work west of the Mississippi. We suspect however, in states like North Carolina with large portions of the EBS spectrum under lease, that it would be impossible for the Commission to decline renewal of most EBS licenses. If, however, the Commission would consider partial renewal of EBS licenses,

based on the census tracts where the build-out requirement has been met, then the UETN plan would work and effectively solve the spectrum warehousing problem we have in rural communities in North Carolina.

Summary and Recommendations

We encourage the Commission to find the balance between effective markets and the long-term interests of educating children with modern technology. Due to technological advances in wireless products over the last decade, EBS represents the single best opportunity to deploy rural Internet access to millions of citizens. EBS could spawn new enterprises, new service providers, and encourage millions of students to broaden their interests with newfound access to content.

We encourage the Commission to consider these goals with respect to EBS:

1. Maximize the use of spectrum to provide the largest possible number of rural students with reliable home (outside of school) access.
2. Minimize disruption to the licenses that are effectively being used by educators directly to provide Internet services to substantial numbers of students.
3. Minimize disruption to leaseholders where investment and buildout has occurred and the current educational use requirement is being met.
4. Leverage EBS to help level the playing field between rural and urban America.

Actions the Commission Should Consider

To achieve these goals, we suggest the following policy changes and actions be taken by the Commission based on our review of numerous NPRM comments and analysis we have performed in North Carolina:

1. New licenses should be merit based. Statewide and large consortia with bona fide capabilities should be given preference.
2. The educational and build-out requirements must be modernized and enforced.
3. Existing licenses should be expanded, within reason, as long as the new requirements are met.

4. Allow for licenses to be reduced in size, down to the census tract, where the build-out requirement is not met upon the renewal date.
5. Develop policies that will encourage small operators to build networks in rural areas, where larger operators cannot justify the business case. Preventing the warehousing of spectrum is key to small rural operator success.
6. Consider a new channel plan in areas where few, or no, EBS licenses have been issued. Spectral efficiency could improve the capabilities of the band.
7. Avoid auctions between public entities.

We thank the Commission and the FCC for their consideration of our thoughts and research on this topic and welcome dialogue.

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